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**REMARKS****Rejection of Claims and Traversal Thereof**

In the March 9, 2005 Office Action:

claims 1-14 were rejected under 35 U.S.C. §112, first paragraph for either lack of written description or enablement; and

claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Michels.

These rejections are traversed and reconsideration of the patentability of the pending claims is requested in light of the following remarks.

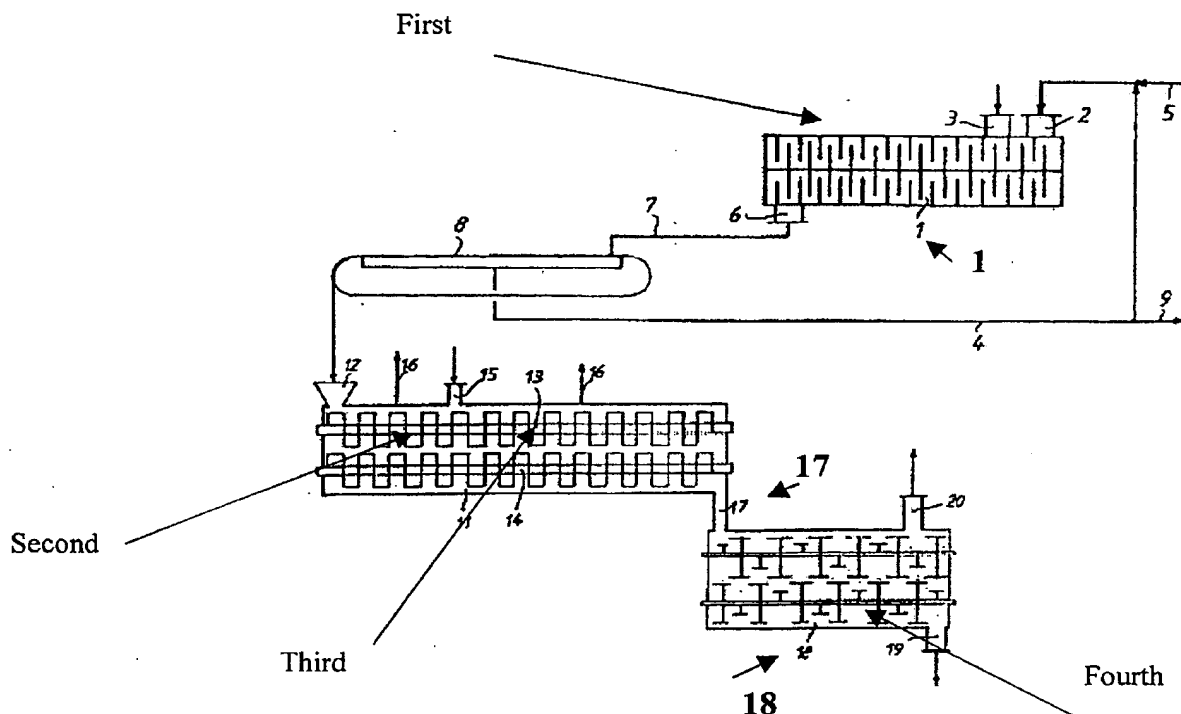
**Rejection under 35 U.S.C. §112, First Paragraph**

Claims 1-8 and 12-14 were rejected under 35 U.S.C. §112, first paragraph as failing to comply with the written description requirement because according to the Office, "Applicant has not pointed out support for the additional shear zones."

Applicants submit that there is ample support for the device and method of use of such device in the present specification. Figure 1 of the specification, recreated below for ease of reference, is a visual illustration of the device and viewed in light of text from the specification provides ample support for the amended claims.

Clearly by viewing the below diagram in light of the specification, one skilled in the art would recognize that the specification provides for four shear zones.

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**First Shearing Zone:** According to the present specification, the first shearing zone in the mixing tank (see page 3, line 6) is described as the mixing of pulp and water and this occurs in compartment 1. Specifically, the specification states that "a cellulose suspension is formed from pulp and an aqueous phase in a mass ratio in the range from 1:3 to 1:40 and maintained for a period of time in the range from 5 to 200 minutes with shearing," (emphasis added). It is further stated at page 4, lines 7 to 9, that "[t]he preferred duration of the shearing treatment of the suspension in step (a) is in the range from 10 to 120 minutes." If the specification is discussing shearing, clearly there is a shearing zone. After this shearing treatment in step (a) the aqueous phase is conveyed via 8 to the compartment 16.

**Second and Third Shearing Zone:** The specification at page 3, lines 11-17, discusses moving the fluid through two more shearing zones, wherein one does not include N-methylmorpholine-N-oxide and the next shearing zone does include the use of N-methylmorpholine-N-oxide. Specifically, the specification states that:

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(c) the damp cellulose material is conveyed, with homogenization, through a first shear zone in the absence of N-methylmorpholine-N-oxide,

(d) the homogenized cellulose material is conveyed through a second shear zone after the addition of enough aqueous N-methylmorpholine-N-oxide that after mixing a suspension with a content of N-methylmorpholine-N-oxide in the liquid phase in a range from 70 to 80 mass-percent results, and"

These next two shearing zones are further discussed at page 7 in the last full paragraph, wherein the exact placement of the shearing zones is discussed, that being, before and after feed opening 15 wherein the N-methylmorpholine-N-oxide is added. Although, these shear zones are described as a first and second shear zone, it is well settled in the law that adequate description under the first paragraph of 35 U.S.C. 112 does not require literal support for the claimed invention, rather it is sufficient if the originally-filed disclosure would have conveyed to one having ordinary skill in the art that the applicant had possession of the concept of what is claimed. See *Ex parte Parks*, 30 USPQ2d 1234 (BPAI 1993). Clearly, a skilled artisan, reading just the text at page 3 of the specification would recognize that three separate shear zones are described from lines 6 to about 20, wherein the first shearing zone is in the mixing tank and the other two zones are in compartment 16 and including shearing without and with the addition of N-methylmorpholine-N-oxide.

**Fourth Shearing Zone:** Finally, the last shearing zone is initially described at page 5 in the first full paragraph, wherein an evaporation step is discussed and the specification states that "[t]he production of the cellulose solution is preferably performed in step (e) in a strong shear field ...." (emphasis added). Further support for this last shearing zone is found at the bottom of page 7 to the top of page 8 in the specification. Specifically, it is stated in the specification that "the apparatus is connected to the downstream end to a multishaft slusher 18, which is used as a dissolving station, by a tube 17. The suspension is transported by the superstructures of the shafts, with shearing and dissolving of the cellulose to output connecting piece 19." (emphasis added). As stated above, if the specification is discussing shearing, clearly there is a shearing zone.

Notably, the Office bears the initial burden of presenting a *prima facie* case of unpatentability. *In re Oetiker*, 24 USPQ2d 1443 (Fed. Cir. 1992). Insofar as the written description requirement is concerned, that burden is discarded by "presenting evidence or reasons why persons skilled in

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the art would not recognize in the disclosure a description of the invention defined by the claims. *In re Wertheim*, 191 USPQ 90 (CCPA 1976). Further, if the specification contains a description of the claimed invention, albeit not in *ipsis verbis*, then the Office, in order to meet the burden of proof, must provide reasons why one of ordinary skill in the art would not consider the description sufficient. Applicants assert that one of ordinary skill in the art would find the present specification provides a clear and concise description of four shearing zones and a method of using same.

Accordingly, applicants respectfully request this rejection under 35 U.S.C. §112, first paragraph for either lack of written description be withdrawn.

Claims 1-8 and 12-14 were also rejected under 35 U.S.C. §112, first paragraph for lack of enablement. According to the Office, "[t]he amended claims defines multiple shear zones which are not detailed in the specification in a manner which would enable an artisan to make and use the invention." Applicants vigorously disagree.

Initially, as noted above, the specification provides clear and concise support for each of the different shearing zones. The device is clearly described and the exact placement of each shear zone is defined relative to the device illustrated in Figure 1. It has been consistently held that the first paragraph of 35 USC 112 requires nothing more than objective enablement. Further, in satisfying the enablement requirement, an application need not teach, and preferably omits, that which is well known in the art. Thus, the specification describes the placement of the different shearing zones and one skilled in the art would know what type of shearing equipment is required and provides the necessary shearing activity.

The Office has the burden of giving reasons, supported by the record as a whole, why the specification is not enabling and requires undue experimentation. A number of factors are relevant to whether undue experimentation would be required to practice a claimed invention, including: (1) the quantity of experimentation necessary, [including shearing equipment in the four different shearing zones does not require undue experimentation because the equipment is well known to those skilled in the art and the placement is defined in the specification]; (2) the amount of direction or guidance presented, [the specification provides ample guidance for

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placement of the different shearing zones]; (3) the presence or absence of working examples, [working examples for each embodiment are not required to meet the enablement requirement because an inventor is speaking to those skilled in the art and thus does not need to explain every detail]; (4) the nature of the invention, [the invention provides for a method and system for extrusion of a solution that is used for cellulose molded bodies]; (5) the state of the prior art, [the state of the prior art in this area is well developed and can contribute significantly to the enabling scope of the disclosure, if required]; (6) the relative skill of those in the art, [the artisan in this field is highly skilled]; (7) the predictability or unpredictability of the art, [extruding cellulose is not considered to be an unpredictable art]; and (8) the breadth of the claims. [there is ample support in the specification for the breadth of the claims]. *In re Wands*, 8 USPQ2d 1400 (Fed. Cir. 1988). Applicants submit that all of the *Wands* factors weigh in favor of enablement, and thus, the specification provides sufficient disclosure to enable those skilled in the art to practice the full scope of the claims.

Applicants request that this rejection under 35 U.S.C. §112, first paragraph for lack of enablement be withdrawn.

Claims 9-11 were rejected under 35 U.S.C. §112, first paragraph for failing to comply with the written description requirement. According to the Office, "means for shearing" within the mixing tank was added to claim 9 and the Office was not able to find support for this in the specification.

The specific text recited in claim 9 is as follows:

"a mixing tank with suspending elements with means for shearing of contained solutions";

As discussed above, the present specification, (see page 3, line 6) discusses the mixing of pulp and water in the mixing tank 1 and in a shearing environment. Specifically, the specification states at page 4, lines 7 to 9, that "The preferred duration of the shearing treatment of the suspension in step (a) is in the range from 10 to 120 minutes." Clearly, if there is a shearing treatment available in the mixing tank 1, then shearing equipment is inherently part of the system. It is well settled in the law that to satisfy the description requirement, an application

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must contain sufficient disclosure, either expressly or inherently, to make it clear to one skilled in the art that the applicant was in possession of the subject matter claim. *In re Eickmeyer*, 202 USPQ 655 (CCPA 1979). Applicants' specification meets this standard.

Accordingly, applicants request that the pending claims be found to meet all requirements of 35 USC 112, first paragraph and these rejections be withdrawn.

**Rejection under 35 U.S.C. §103(a)**

Claim 15 was rejected under 35 U.S.C. §103(a) as being unpatentable over Michels. Applicants submit that Michels does not render applicants' claimed invention *prima facie* obvious.

Applicants' claim 15 recites as follows:

15. A method for the continuous production of an extrusion solution for the formation of cellulosic molded bodies, such as fibers and films, according to the lyocell method, wherein

(a) forming a cellulose suspension comprising pulp and an aqueous phase in a mass ratio in the range from 1:3 to 1:40 and shearing the cellulose suspension for a period of time in the range from 5 to 200 minutes;

(b) dewatering the cellulose suspension to form a fleece material with a cellulose content in the range from 20 to 80 mass-percent, wherein a portion of dewatered aqueous phase is reused for forming the cellulose suspension and a portion of the aqueous phase is discarded thereby removing at least a portion of impurities in the aqueous phase;

(c) shearing the fleece material in the absence of N-methylmorpholine-N-oxide, to form a homogenized cellulose material;

(d) adding a sufficient amount of aqueous N-methylmorpholine-N-oxide to the homogenized cellulose material to form a cellulose suspension with a content of N-methylmorpholine-N-oxide in the liquid phase in a range from 70 to 80 mass-percent and shearing the cellulose suspension in aqueous N-methylmorpholine-N-oxide to evaporate excess water and form the extrusion solution. (emphasis added)

Michels describes a method that includes:

1) enzymatically pretreating cellulose, optionally in a shear zone

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- 2) separating the pretreated cellulose from the bath, wherein all of the enzyme bath is recycled for reuse in step (1);
- 3) dissolving the pretreated cellulose directly into a melt of N-methylmorpholine-N-oxide under shearing conditions
- 4) degassing with simultaneous water removal.

According to the Office:

"It would have been obvious to one having ordinary skill in the art at the time the invention was made to include an additional step of shearing the cellulose before the addition of NMMO, because homogenizing a mixture prior to adding a component such as NMMO is known in the art. This allows the NMMO to be more effectively mixed."

Applicants vigorously disagree and submit that the cited reference does not describe, teach or suggest all the claim limitations recited in applicants' claimed invention.

Initially it should be noted that Michels does not teach or suggest a method or a system for removing and reducing the content of soluble impurities in the aqueous phase. According to the Michels' method, all of the aqueous phase separated during the dewatering process, which includes the enzymes, is recycled and reused thereby reducing the cost of enzyme replenishment.

In contrast, applicants discard a portion of the aqueous phase from step (b) and recycle a portion back to the mixing tank. Thus, for the production of the cellulose suspension in step (a), a portion of the aqueous phase is recycled from the dewatering of step (b) and fresh water is added thereto. Importantly, the remaining portion from the dewatering step (b) is discarded which reduces the amount of impurities in the aqueous phase.

As stated in applicants' response of December 21, 2004, it is incumbent on the Office to provide some suggestion or teaching in the prior art that would lead one skilled in the art to proceed in the direction of applicants' claimed invention. Applicants respectfully submit that the Office has not provided any objective or specific teachings or suggestions in the cited prior art to motivate one skilled in the art to modify the Michels reference. What is the asserted motivation put forth in Michels to recycle only a portion of the excess fluid from the dewatering step to reduce contamination of the aqueous phase with soluble impurities? Clearly, there is none. The Courts have addressed this issue numerous times in a wide variety of factual circumstances and have stated that "[t]he mere fact that the prior art could be so modified would not have made the

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modification obvious unless the prior art suggested the desirability of the modification." *In re Mills*, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). Thus, this allegedly "obvious" direction is supported only by the Office's reinterpretation of the art in light of applicants' disclosure.

Applicants submit that the Office failed to give weight to the advantages of the present invention as part of the "invention as a whole" and cited a reference that does not disclose or teach such advantages including the fact that the present invention recycles at least a portion of the fine fibres while reducing the impurities in the aqueous phase of step (a). Instead, the Michels system completely recycles the enzymatic fluid and there is no incentive in the Michels reference to discard any of the enzymatic fluid because of the cost of the enzymes. Clearly, Michels does not deal with the problem of the impurities and in fact never even recognizes that in the process of recycling all of the enzymatic fluid, the soluble impurities accumulate and as such are incorporated into the cellulose suspension, which is detrimental to the extruded fibers.

According to the Office, the Michels reference provides incentive to provide for shearing of the cellulose solution before introduction of the NMMO. However, after a very thorough review of the Michels reference, applicants found absolutely no discussion of subjecting a damp cellulose suspension to shearing before introduction of the NMMO. Instead, the only discussion in Michels, relates to using shearing or stirring along with the NMMO (See paragraphs 2, 3 and 4 on page 1 of Michels).

The Office make reference to claim 10 in Michels and the fact that the "cellulose is whipped before enzymatic pretreatment with shearing in water" and contends that this statement provides incentive for shearing the solution before the introduction of NMMO. Applicants submit that the shearing with enzymatic treatment is an entirely different step from that of "dissolving the pretreated cellulose directly into a melt of N-methylmorpholine-N-oxide under shearing conditions" because the pretreated cellulose is then subjected to a separation step before the dissolving step directly into a melt of N-methylmorpholine-N-oxide under shearing conditions. Clearly, applicants' claimed invention does not include an intermediate step from the shearing without NMMO and the shearing with NMMO.



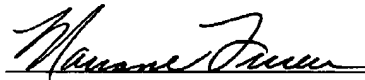
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Applicants submit that a *prima facie* case of obviousness has not been established, since Michels is fundamentally deficient in teaching or suggesting applicants' claimed invention. As such, applicants request the withdrawal of this rejection of claims 9-11 under 35 U.S.C. §103(a).

### Conclusion

Applicants have satisfied the requirements for patentability. All pending claims are free of the art and fully comply with the requirements of 35 U.S.C. §112. It therefore is requested that Examiner Purvis reconsider the patentability of all pending claims in light of the current amendment, and withdraw all rejections, thereby placing the application in condition for allowance. Notice of the same is earnestly solicited. In the event that any issues remain, Examiner Purvis is requested to contact the undersigned attorney at (919) 419-9350 to resolve same.

Respectfully submitted,



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